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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,662	09/15/2003	Nobuhiko Izuta	242866US0	9353
22850	7590	09/01/2005		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER AHMED, SHAMIM	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/661,662

Applicant(s)

IZUTA ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-8 in the reply filed on 8/5/05 is acknowledged. The traversal is on the ground(s) that examiner fails to provide sufficient reason that the two groups of invention are patentable distinct. This is not found persuasive because reason is provided in the previous election/restriction requirement and has acquired different status in the art as their different classification.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokomizo et al (6,399,517).

Yokomizo et al disclose a process of etching semiconductor wafer having silicon nitride layer on it and the process including the steps of:

- exposing the wafer in an etching bath including phosphoric acid (col.3, lines 34-46);
- circulating the etching bath comprising a circulation pipe line 20A provided with a circulation pump 21, a filter 23 and adding or supplying pure water from a water source 24 (col.4, lines 13-25 and figure 1).

Yokomizo et al also disclose that during the etching process silicon concentration increases in the etching solution as particles, which are removed by the filter 23 in process of passing through the circulation (col.6, lines 6-11).

Yokomizo et al further disclose that pure water is added into the etching bath by diluting the bath with the pure water, which causes a lowering the concentration of the phosphoric acid solution and as well as lowering the temperature of the etching solution (col.6, lines 31-47).

Yokomizo et al teach that a temperature controller (22) is provided after the filtration system (23) in order to maintain designated temperature for the etching solution (col. 6, lines 50-col.7, lines 3).

Yokomizo et al remain silent regarding the concentration drop or lowering the concentration of the phosphoric acid solution is 80-50 wt. % and also cooling down the etching solution to 100 degree to room temperature (claim 4).

However, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to optimize the same as the Yokomizo et al teach that both the concentration and the temperature are maintained within the respective designated ranges for efficiently maintaining the etching process (col.7, lines 1-3).

Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to claim 8, Yokomizo et al discussed above that regeneration and filtration are both performed together but remain silent regarding splitting into two streams.

However, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguishing the processes. *Ex parte Rubin* 128 USPQ 440 (PTO Bdpat App 1959).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ban (6001,215) discloses a process of etching silicon nitride in a phosphoric acid bath, wherein measuring the concentration of silicon compound and circulating the bath through a filter for removing impurities from the solution;

Reis (6,255,123) teaches monitoring an etching bath containing phosphoric acid solution by measuring the concentration of species in the solution and Glick et al (6,207,068) teach an etching process for silicon nitride, wherein circulating the etching

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solution of phosphoric acid through a filter and concentration of the solution is maintained by adding water; Kezuka et al (6,159,865) teach filtering an etching solution for cleaning the solution (col.1, lines 27-43).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed
Primary Examiner
Art Unit 1765

SA
August 24, 2005